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New data and taxa for Orthoptera Tettigoniidae and Acrididae from tropical Africa

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Summary. The results of a long-term study on the Orthoptera collected in tropical Africa and preserved in different European natural history museums are reported. *Horatosphaga bazeletae* n. sp. is described from South Africa, *Dapanera falxcercata* n. sp. from Cameroon, *Eurycorypha specularia* n. sp. from Zambia (Tettigoniidae Phaneropterinae), and *Eucoptacra popovi* n. sp. (Acrididae Coptacrinae) from the Gabon. Furthermore, the new genus *Pigalua* n. gen. is described for *Eulioptera insularis* Ragge, 1980 from Annobón Is. (Equatorial Guinea). The new tribe Kevaniellini n. trib. is proposed for *Kevaniella bipunctata* Chopard, 1954. Besides, the hitherto unknown males of *Eurycorypha flavescens* (Walker, 1869) and *Eurycorypha klaptoczi* Karny, 1917 from West Africa are described. In addition, new records or unknown taxonomical characters are reported for five species of *Horatosphaga*, *Peronura clavigera* Karsch, 1889, *Prospahaga splendens* Ragge, 1960, *Kevaniella bipunctata* Chopard, 1954, *Eurycorypha prasinata* Stål, 1874, *Poreuomena lamottei* Chopard, 1954, *Tylopsis fissa* Ragge, 1964, *Catoptropteryx extensipes* Karsch, 1896 and *Mangomaloba latipennis* Chopard, 1954 (Tettigoniidae Phaneropterinae).

Résumé. Nouvelles données et nouveaux taxa pour des Orthoptères Tettigoniidae et Acrididae d'Afrique tropicale. Les résultats de l'étude de nombreux Orthoptères collectés en Afrique tropicale et conservés dans divers musées européens, sont présentés. Les nouvelles espèces suivantes sont décrites : *Horatosphaga bazeletae* n. sp. d'Afrique du Sud, *Dapanera falxcercata* n. sp. du Cameroun, *Eurycorypha specularia* n. sp. de Zambie (Tettigoniidae Phaneropterinae), et *Eucoptacra popovi* n. sp. (Acrididae Coptacrinae) du Gabon. Le genre *Pigalua* n. gen. est créé pour *Eulioptera insularis* Ragge, 1980 de l'île d'Annobon (Guinée équatoriale). Une nouvelle tribu, Kevaniellini n. trib., est proposée pour le taxon africain *Kevaniella bipunctata* Chopard, 1954. Les mâles jusqu'ici inédits d'*Eurycorypha flavescens* (Walker, 1869) et *E. klaptoczi* Karny, 1917, espèces d'Afrique de l'Ouest, sont décrits. Enfin, de nouvelles données de répartition et des caractères morphologiques jusqu'ici ignorés sont apportés pour cinq espèces du genre *Horatosphaga*, ainsi que pour les espèces suivantes de Tettigoniidae Phaneropterinae : *Peronura clavigera* Karsch, 1889, *Prospahaga splendens* Ragge, 1960, *Kevaniella bipunctata* Chopard, 1954, *Eurycorypha prasinata* Stål, 1874, *Poreuomena lamottei* Chopard, 1954, *Tylopsis fissa* Ragge, 1964, *Catoptropteryx extensipes* Karsch, 1896 et *Mangomaloba latipennis* Chopard, 1954.

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Keywords: taxonomy; tropical Africa; new taxa; new records

The present knowledge of taxonomical diversity of some orders or families of insects is still insufficient for tropical Africa and surroundings islands. Tropical forest canopy is known as one of the most diversified environments, which holds many ecological niches where numerous species of insects and other animals have adapted and evolved (Malhi et al. 2013). Some of them live only at well-defined layers of the vegetation and may be detected only by chance during entomological surveys (e.g. by the light that attracts them during the night). The tropical forest region of Central and West Africa, also known as the Guineo-Congolian region, is the second largest tropical forest of the world, with 89.3% of the total forest surface in Central and 6.0% in West Africa (Malhi et al. 2013). Due to the large diversity of habitats, tropical Africa is a land where a high number of species of grasshoppers and katydids underwent multiple episodes of

speciation. Natural history museums take care of huge numbers of specimens collected during zoological expeditions to unexplored and remote regions in Africa; to date only a portion of this material has been studied, and much work is still waiting. Even if research and collecting have been carried out since the 1800, much work is still required to have a sufficient knowledge both in taxonomical and distributional terms. Everyone who has the possibility to visit natural history museums to study insects is surprised by the high number of unidentified specimens, probably belonging to undescribed taxa. The present paper reports on some new or little known taxa of specimens preserved in different European museums; results show the importance of these public collections, the low level of knowledge of some systematic groups and the scientific potential to investigate the different and numerous evidences of the biodiversity mosaic.

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Material and methods

Specimens from the following museums and collections were included in this study:

MSNG, Museo Civico di Storia Naturale 'G.Doria', Genoa, Italy
MSNM, Museo Civico di Storia Naturale, Milan, Italy

MZUF, Museo di Zoologia 'La Specola', University of Florence, Italy

NHM, The Natural History Museum, London, UK

NMHP, National Museum Natural History, Prague, Czech Republic

NMW, Naturhistorisches Museum, Vienna, Austria

BMCP, Bruno Massa Collection, University of Palermo, Italy

Some specimens were photographed with a Nikon Coolpix 4500 digital camera (Japan), mounted on a Wild M5 Stereomicroscope (Germany), and photos were integrated using the freeware CombineZP (Hadley 2008). Mounted specimens were measured with a digital calliper (precision 0.01 mm); the following measurements were taken (all in mm). Body length: dorsal length from the head to the apex of the abdomen, ovipositor excluded in females; pronotum length: length of the pronotum along dorsal median line; hind femur: length of hind femur; tegmina: length and maximum width of tegmina; ovipositor: maximum length (the curvature of the ovipositor is not considered, the measurements were taken from the subgenital plate to the tip of the ovipositor).

Collecting authorizations are reported in the acknowledgements.

Results

Family Tettigoniidae Krauss, 1902

Subfamily Phaneropterinae Burmeister, 1838

Tribe Acrometopini Brunner von Wattenwyl, 1878

Horatosphaga inclusa (Karsch, 1893)

(Figure 1A, 1C, 1E, 1F, 1K, 1L)

Material examined. Ivory Coast, Dabakala [8°12'4.94"N 04°23'33.14"W], 242 m, 22–27.V.2015 (UV) (1 ♂) (BMCP); Ivory Coast, Mt. Tonkoui [07°27'15.2"N 07°38'12.5"W], 1200 m, 30.XI.2015 (UV) (1 ♂) (BMCP).

Remarks. *Horatosphaga inclusa* has the 10th male abdominal tergite very stout and variable and may be confused with *H. crosskeyi* Ragge, 1960. There are differences in the stridulatory file; in *H. inclusa* it is curved, 1.4 mm long, and consists of *c.*100 teeth, of which the central ones are higher than the others (Figure 1A); the stridulatory file of *H. crosskeyi* is similar, 1.4 mm long, and consists of *c.*100 teeth, of which the distal ones are higher than the others (Figure 1B). Other differences lie in the apical part of the 10th male tergite, that in lateral and dorsal views in *H. inclusa* is thicker, while in *H. crosskeyi* it is thinner (Figure 1C, 1D, 1E, 1G); the subgenital plate of *H. inclusa* is apically diverging and has a wide v-shaped concavity (Figure 1F), while that of *H. crosskeyi* is more or less rectangular and ends with a narrower concavity (Figure 1H). *H. inclusa* and *H. crosskeyi* are undoubtedly morphologically closely related; however, the differences in the stridulatory file result in different songs, and this is an important specific barrier.

Distribution. Previously recorded from Ghana and Togo, here reported also from the Ivory Coast; records of *H. crosskeyi* from the Ivory Coast [Massa 2016; Comoe, Kolomabira and Zamou (4 ♂, 1 ♀)] have to be identified as *H. inclusa* (see *H. crosskeyi*); it is a new record from Ivory Coast.

Horatosphaga crosskeyi Ragge, 1960

(Figure 1B, 1D, 1G, 1H)

Material examined. Cameroon, National Park Benoué, Camp. Buffle Noir 21.XI.2006, S. Vanni & A. Nistri (1 ♂) (MZUF).

Distribution. *Horatosphaga crosskeyi* is new to Cameroon; this species was described from Nigeria (Ragge 1960a). Later, it has been recorded from Senegal (Ragge & Roy 1961) while records from the Ivory Coast (Massa 2016) have to be referred to *H. inclusa* (see above).

Horatosphaga heteromorpha (Karsch, 1889)

(Figure 1M)

Material examined. Somalia, Gumbo [0°14'N 42°37'E] 1909, G. Ferrari (1 ♂) (MSNG); Somalia, Giuba, Uabi Mana II.1911, C. Citerni (1 ♂) (MSNG); Ethiopia, Bass Narok (= Lake Turkana) VIII–IX.1896, V. Bottego (1 ♀) (MSNG); Somalia, El Ellan, Ceel Cellan I.1968, Funaioli (1 ♂) (MZUF).

Remarks. The stridulatory file of *H. heteromorpha* consists of *c.*90 teeth, 1.5 mm long, with a conspicuously raised group of *c.*20 teeth in distal part, and another, less high, of *c.*10 teeth in central part (Figure 1M).

Distribution. From savannah grass- and bushlands to forest edge and forest clearings in the montane zone of East Africa (Hemp 2013).

Horatosphaga concava Ragge, 1960 (Figure 1I, 1J)

Material examined. Democratic Republic of Congo, Upper Uele, Kapili V.1927, F.S. Patrizi (1 ♂) (MSNG).

Remarks. The male of *Horatosphaga concava* is characterized by two swollen apices on the 10th abdominal tergite (Figure 1I). The stridulatory file is also very peculiar: it consists of *c.*80 teeth, *c.*1.4 mm long, of which *c.*50 in the proximal part are closely spaced, while *c.*30 in the distal part are more widely spaced (Figure 1J).

Distribution. Previously known from Sudan and Kenya (Hemp 2006), new to Democratic Republic of Congo.

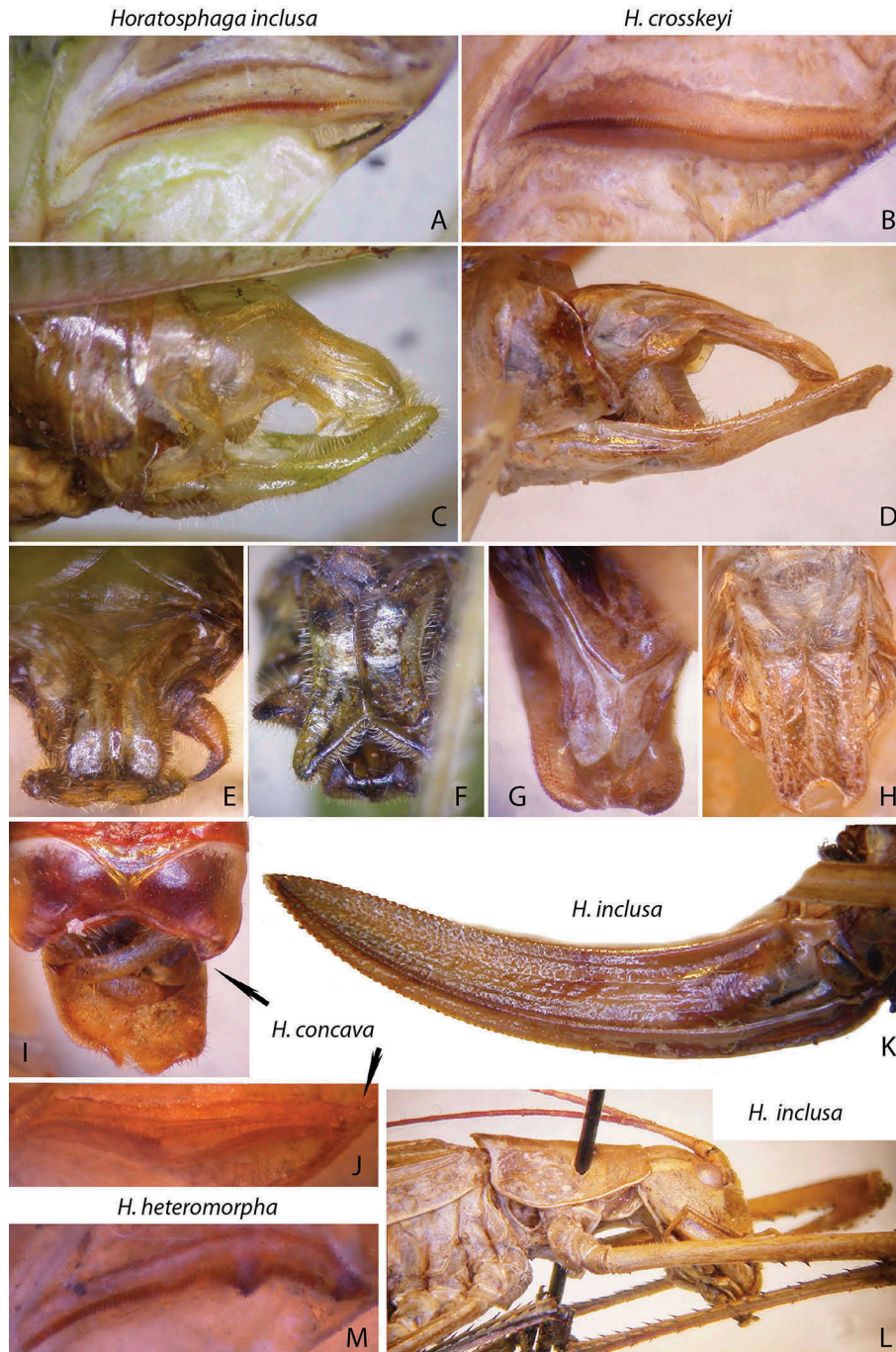


Figure 1. *Horatosphaga* spp. **A, B**, ♂, stridulatory files: **A**, *H. inclusa* (Karsch); **B**, *H. crosskeyi* Ragge. **C, D**, ♂, lateral view of last abdominal segments: **C**, *H. inclusa*; **D**, *H. crosskeyi*. **E, F**, *H. inclusa*, ♂: **E**, dorsal view of last tergite; **F**, subgenital plate. **G, H**, *H. crosskeyi*, ♂: **G**, dorsal view of last tergite; **H**, subgenital plate. **I, J**, *H. concava* Ragge, ♂: **I**, last tergite and cerci; **J**, stridulatory file. **K, L**, *H. inclusa*: **K**, ♀, ovipositor; **L**, ♂, lateral view of head and pronotum. **M**, *H. heteromorpha* (Karsch), ♂, stridulatory file.

***Horatosphaga leggei* (Kirby, 1909)**

23.VIII.1994, L. Bartolozzi (1 ♂) (MZUF).

Material examined. Uganda, Entebbe [3°00'N 32°28'E] 1907, C. Berti (1 ♂) (MSNG); Uganda, Thoro 1909, C. Berti (1 ♂) (MSNG); Rwanda, Ruhengeri [1°30'S 29°38'E]

Distribution. Montane areas of East Africa to Democratic Republic of Congo (Ragge 1960a; Hemp 2006; Massa 2015b).

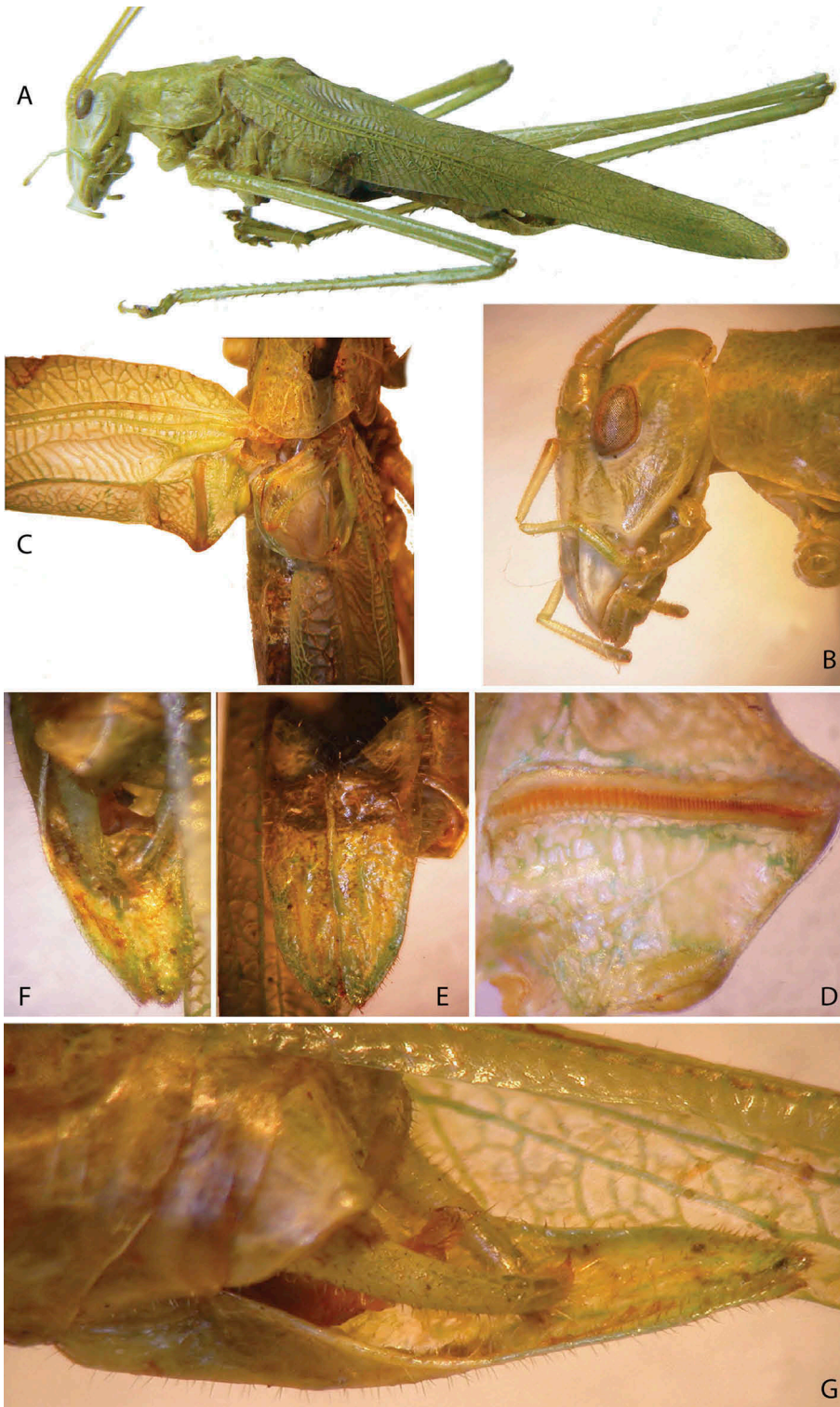


Figure 2. *Horatosphaga bazeletae* n. sp. **A**, Habitus in lateral view. **B**, Head in lateral view. **C**, Stridulatory area of the left and right tegmina. **D**, Stridulatory file of left tegmen. **E**, Ventral view of subgenital plate. **F**, Subgenital plate and cerci from above. **G**, Lateral view of subgenital plate and cerci.

Horatosphaga bazeletae n. sp. (Figures 2A–4G)

Type material. Holotype: ♂, South Africa, Transvaal, Pretoria [25°45'S 28°14'E] 1.I.1983, G. Costa (Coll. M. La Greca, MSNM).

Description of male. Uniformly green (Figure 2A).

Fastigium of vertex sulcate, fastigium of frons pointed, extending upwards beyond fastigium of vertex. Eyes oval (Figure 2B), $c.1/3$ of the length of the head.

Pronotum smooth without lateral carinae.

Tegmina narrow, much longer than body length, but no longer than flexed hind knees, about 7.3 times longer than broad. Alae reduced to small scales. Stridulatory area of left and right tegmina illustrated in Figure 2C. Stridulatory file, 0.8 mm long, consists of $c.80$ teeth more and more close from distal to proximal area (Figure 2D).

Fore legs missing on holotype. Mid and hind femora unarmed, mid tibiae with 11 inner and 13 outer ventral and

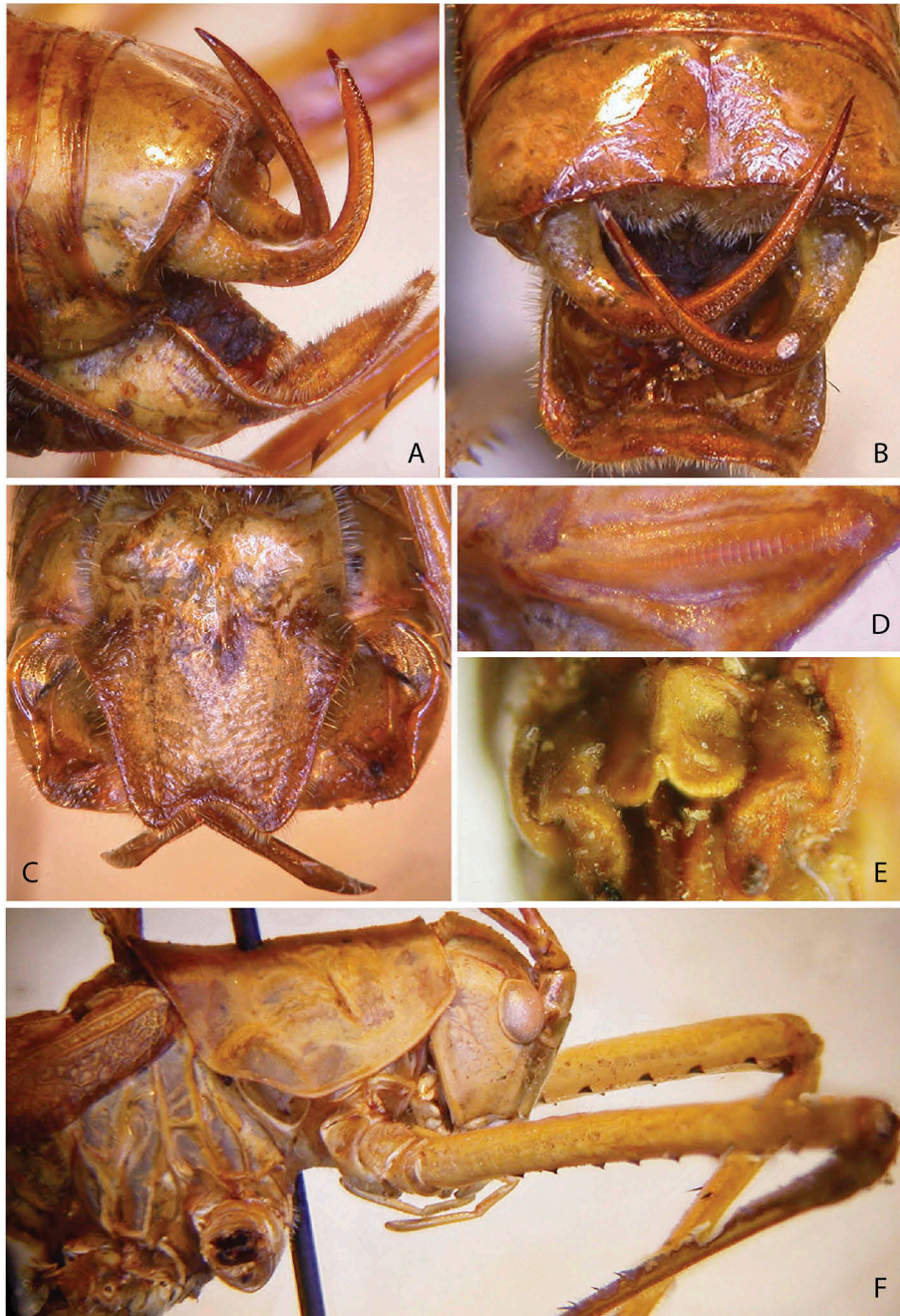


Figure 3. *Peronura clavigera* Karsch. A, B, ♂, last abdominal segments: A, lateral view; B, posterior view. C, ♂, subgenital plate. D, ♂, stridulatory file. E, ♀, subgenital plate. F, ♂, lateral view of head and pronotum.

dorsal spines + 1 spur on each side, hind tibiae with 5 ventral inner and outer spines + 1 spur on each side, and 10 dorsal inner and outer spines + 1 spur on each side.

Cerci stout, incurved and apically pointed (Figure 2F, 2G). Subgenital plate long and concave, apically converging with two apices separated by a very narrow concavity (Figure 2E, 2F, 2G). Styli absent.

Female. unknown.

Measurements. Body length: 20.5; length of pronotum: 4.1; height of pronotum: 1.8; width of pronotum: 2.2; length of tegmina: 22.0; width of tegmina: 3.0; length of hind femur: 22.2.

Etymology. This species is dedicated to Corinna Bazelet, for her contribution to the conservation of Orthoptera in South Africa.

Remarks. According to Ragge (1960a, 1961), the genera *Horatosphaga* and *Lamecosoma* Ragge, 1960 are closely related and both may have the body very attenuate and may

lack posterior wings. However, while *Lamecosoma* has femora armed with small spines, *Horatosphaga* has femora unarmed. The genus *Horatosphaga* is widely distributed in tropical Africa; *Lamecosoma* is currently known from Kenya, Rhodesia, Zambia and Tanzania (Ragge 1960a, 1961; Hemp 2002, 2006, 2013). The specimen from South Africa has characteristics that generally lie in the variation of the genus *Horatosphaga*, but the remarkable attenuation of its body is reminiscent of the genus *Lamecosoma*; however, the eyes are oval, while in *Horatosphaga* and *Lamecosoma* they are rounded. Nevertheless, it is here described as a new species tentatively belonging to the genus *Horatosphaga*.

Affinities. *H. bazeletae* n. sp. is related to two species of *Horatosphaga* lacking posterior wings, *H. meruensis* (Sjöstedt, 1910) from Tanzania and *H. nuda* Ragge, 1960 from Sudan. It differs from both in the subgenital plate (longer) and cerci (shorter) and in the venation of right and left tegmina (cf. figures 31 and 32 of Ragge 1960a and photographs in Cigliano et al. 2016). Additionally, Hemp

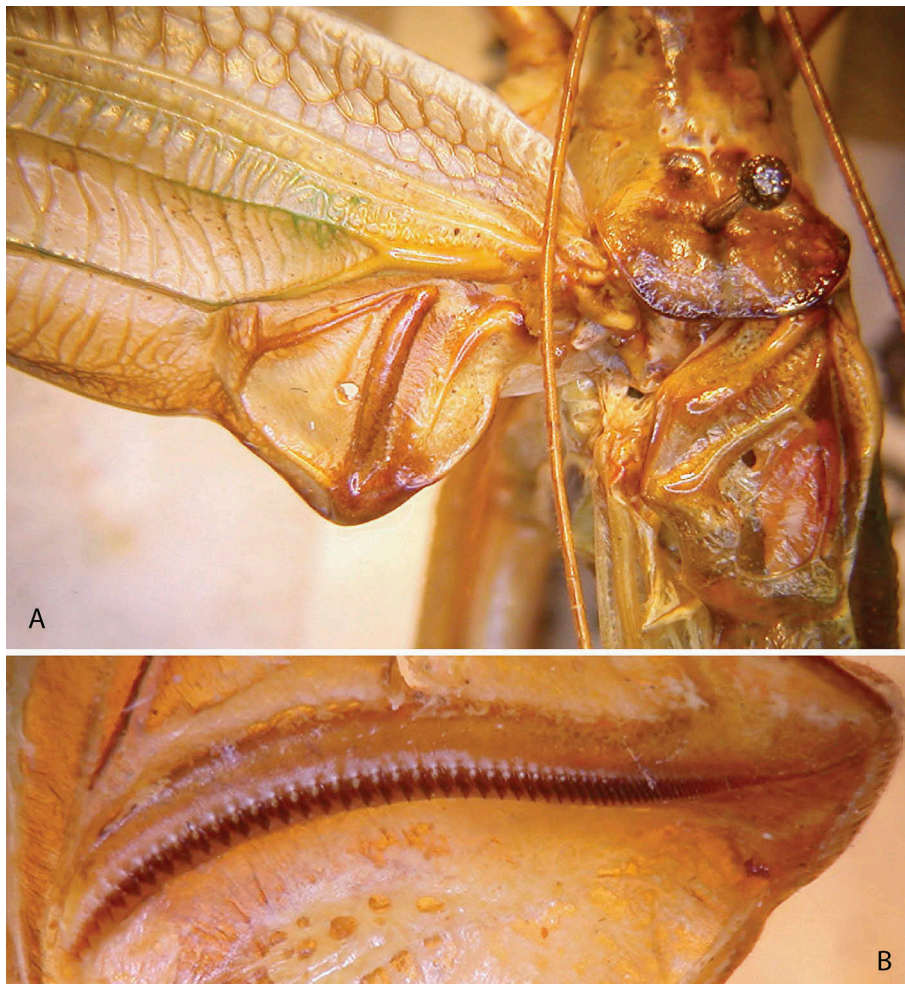


Figure 4. *Prosphaga splendens* Ragge, ♂. **A**, Dorsal view of stridulatory area. **B**, Stridulatory file.



Figure 5. *Kevaniella bipunctata* Chopard. **A**, ♂, dorsal view of head and pronotum. **B**, ♂, lateral view of last abdominal segments. **C**, ♂, spines on genicular lobes of hind legs. **D**, ♂, subgenital plate. **E**, ♀, lateral view of ovipositor. **F**, ♀, subgenital plate. **G**, ♂, lateral view of head and pronotum.

(2007) described the fragile and slender *H. tenera* with reduced hind wings; she considered it related to *H. meruensis* and *H. nuda*. The male of *H. tenera* has also a

shorter subgenital plate compared to that of *H. bazeletae*. Finally *H. bazeletae* has eyes more oval than the previous and other species of *Horatosphaga*.

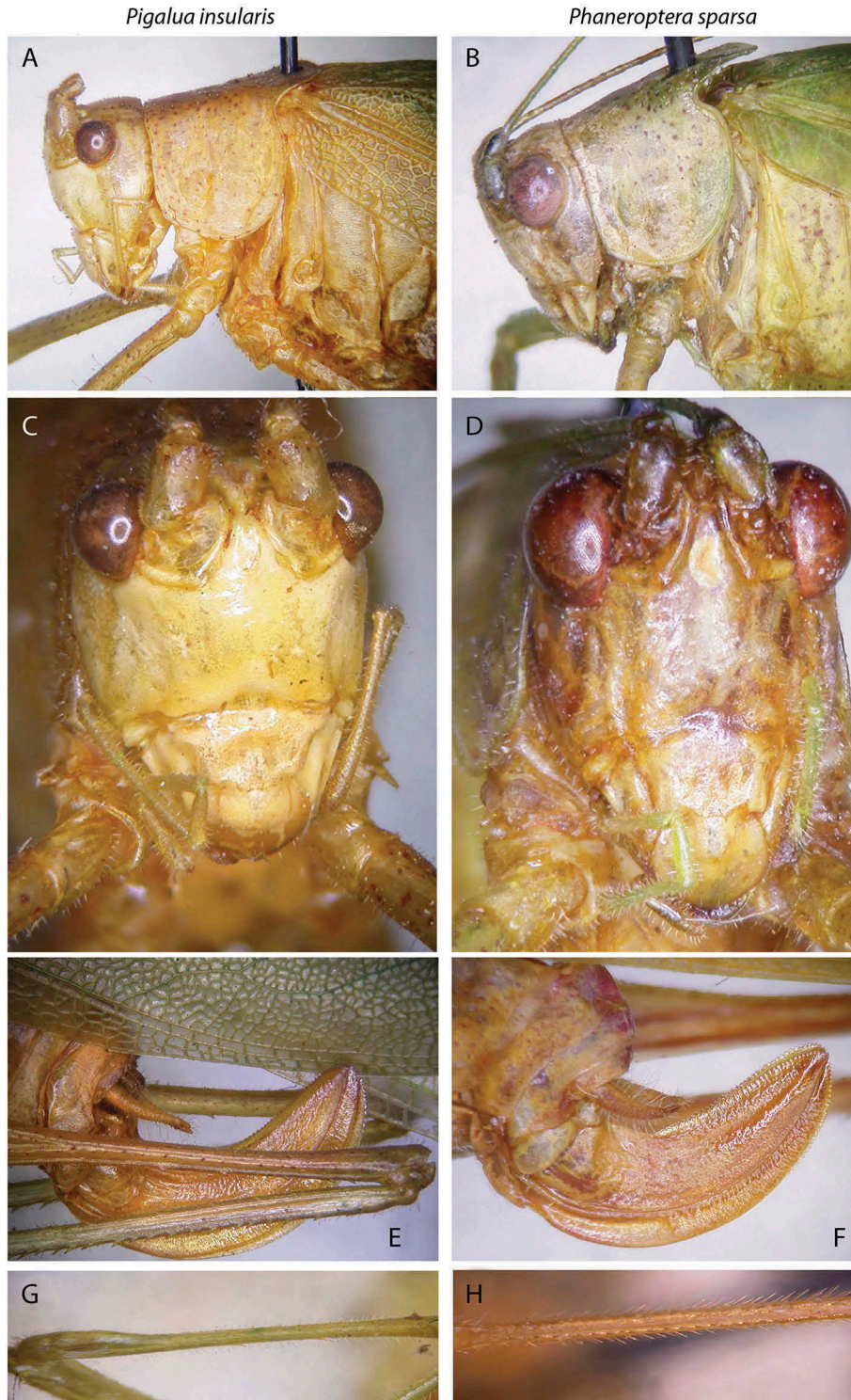


Figure 6. Comparison of *Pigalua insularis* (Ragge, 1980) with *Phaneroptera sparsa* Stål, 1857. **A, B**, ♂, lateral view of head and pronotum. **C, D**, ♂, face. **E, F**, ♀ ovipositor. **G, H**, dorsal view of fore tibia.

Distribution. Known only from Transvaal, South Africa.

Note on the species of the genus *Lamecosoma*. According to the art. 31.2 of the ICZN (2012, Agreement in gender), “A

species-group name, if it is or ends in a Latin or Latinized adjective or participle in the nominative singular, must agree in gender with the generic name with which it is at any time combined”. *Lamecosoma* is composed of $\lambda\alpha$ (from Greek:

prefix with intensive force), μήκος (from Greek: length) and σωμα (from Greek: body, neuter); thus, the name *Lamecosoma* is neuter and consequently the name of species, being adjective, must agree with it: *Lamecosoma tenue* and *Lamecosoma inerme* [not *tenuis* and *inermis*, as in the original descriptions of Ragge (1960a, 1961)].

Peronura clavigera Karsch, 1889 (Figure 3A–3F)

Material examined. Kenya, Taita District, surroundings of Voi [03°23'49"S 38°33'12"E], 30.V-2.VI.1994, L. Bartolozzi, B. Cecchi, A. Sforzi (1 ♂) (MZUF); Kenya, Embu District, Siakago [0°35'33"S 37°38'33"E], I.1996 (2 ♀) (MSNG); Kenya, Embu District, Nguthi [0°35'12"S 37°44'34"E], 28.II.1998 (1 ♀) (MSNG).

Remarks. *Peronura clavigera* is the only brachypterous representative of the genus (Figure 3F), characterized by its peculiar male genitalia (Figure 3A–3C) and female subgenital plate (Figure 3E). The stridulatory file is very reduced and consists of *c.*50 teeth, of which at least 30 on the distal part are more widely spaced than in the proximal part (Figure 3D).

Distribution. Tanzania and Kenya (Ragge 1960a; Hemp 2013).

Prosphegma splendens Ragge, 1960 (Figure 4A, 4B)

Material examined. Somalia, Bud bud [04°39'26"N 46°56'25"E] 28.XI–4.XII.1982 (3 ♂) (MSNG).

Remarks. *Prosphegma splendens* has characteristic raised stridulatory areas both in the left and right tegmina (Figure 4A); the stridulatory file, *c.*2.2 mm long, consists of *c.*80 teeth, more widely spaced in the proximal part and closed spaced in the distal one (Figure 4B).

Distribution. Ragge (1980) described *P. splendens* from specimens collected at Werder (East Ethiopia) (06°54'19"N 45°18'34"E); Somalian locality Bud bud is not far from Werder (*c.*300 km).

Tribe Kevaniellini n. trib.

Type genus. *Kevaniella* Chopard, 1954.

When Chopard (1954a) described the genus *Kevaniella*, he highlighted that its sole representative *K. bipunctata* was a rather extraordinary insect difficult to place systematically. He suggested that Pardalotini Brunner von Wattenwyl, 1878 could be possible relatives. Ragge (1980) was also unable to find relatives in the subfamily Phaneropterinae. The genus *Kevaniella* indeed has very peculiar characters that justify the description of a new tribe for it.

Characters of the Kevaniellini n. trib. are the following: general shape slender with long legs, fastigium of vertex narrow not contiguous with fastigium of frons, eyes rounded, globular (Figure 5A), pronotum longer than high with the insertion on the disc rounded (Figure 5G), coxae unarmed, femora unarmed, tibiae armed superiorly and inferiorly, tympana of fore tibiae open, oval, all the genicular lobes armed with an evident spine (Figure 5C), ovipositor long, narrow, gently up-curved (Figure 5E, 5F).

Kevaniella bipunctata Chopard, 1954 (Figure 5A–5G)

Material examined. Somalia, El Ellan, Ceel Cellan 24.XI–4.XII.1985 (1 ♂) (MZUF); Somalia, Guddo, road to Baled 23.VI.1984, L. Bartolozzi (1 ♀) (MZUF).

Remarks. Figure 5A–5G present some characters in the male and female of this peculiar species.

Distribution. Known from Kenya (Chopard 1954a), Ethiopia and Somalia (Ragge 1980).

Tribe Phaneropterini Burmeister, 1838

Pigalua n. gen. (Figure 6A, 6C, 6E, 6G)

Type species. *Eulioptera insularis* Ragge, 1980, here designated.

Description. Head. Fastigium of vertex narrow and pointed, not contiguous with the fastigium of frons, much narrower than the first antennal segment. Eyes round, small, moderately prominent, *c.*1.5 times as long as the subocular groove, and as wide as the retroocular space (Figure 6A). Scapus placed within an area with raised margins and a bit narrower than the eye. Face without fronto-genal carinae below antennae (Figure 6C).

Thorax. Pronotum longer than high, humeral excision not very deep (Figure 6A).

Legs. Fore coxae armed with a spine, fore tibiae rounded, not furrowed superiorly (Figure 6G), fore femora with ventral spines, fore tibiae with ventral spines, open tympanum on inner and on outer sides. Mid femora and tibiae with ventral spines. Hind femora with ventral spines, hind tibiae with ventral spines and only 1 apical spur.

Tegmina well developed, slightly shiny and a bit shorter than hind wings.

Ovipositor gently up-curved, 2.4 times longer than pronotum (Figure 6E).

Diagnosis. *Pigalua* n. gen. is vaguely similar to *Phaneroptera* Serville, 1831 and *Eulioptera* Ragge, 1956, mainly in the general shape. Some characters of this taxon, such as rounded, not furrowed upper side of fore legs, small eyes, tibiae with only 1 apical spur, and ovipositor longer than pronotum, are not present in any

Phaneroptera and *Eulioptera* species. However, *Phaneroptera* and *Eulioptera* have the upper surface of fore tibiae furrowed (Figure 6H), wider and higher eyes (*c.*0.8–1.0 times as long as subocular groove and much wider than the retroocular space) (Figure 6B, 6D), scapus much smaller than eyes, lateral lobes of pronotum with different shape, a deeper humeral excision (Figure 6B), tegmina distinctly shorter than hind wings, and ovipositor of smaller size and different curvature (Figure 6F). When Ragge (1980) described *Eulioptera insularis*, he highlighted that it is the sole species of the genus with only 1 apical spur on each side of hind tibiae; other species have 2–3 apical spurs. Within the genus *Phaneroptera*, only *P. albida* Walker, 1869 has 2 apical spurs, while other species have 3 apical spurs (Ragge 1960b, 1980). Among species with open tympana few genera have fore tibiae not furrowed superiorly (e.g. *Parapyrrhicia* Brunner von Wattenwyl, 1891, *Symmetroraggea* Massa, 2015a). Thus, characters of this taxon are exclusive.

Etymology. From autochthonous language: *Pigalu* = local name of the island Annobón (also known as *Pogalu*), where this taxon is known for certain (Ragge 1980).

***Pigalu insularis* (Ragge, 1980) n. comb.
(Figure 6A, 6C, 6E, 6G)**

Material examined. Equatorial Guinea, Annobón Is. (= *Pigalu*) V.1902, L. Fea (1 ♀) (MSNG).

Remarks. Some additional morphological characters of this species are the following. Yellow-greenish with small reddish dots on the head, pronotum, femora and abdomen. Tegmina green.

Fastigium of vertex narrow and pointed, not contiguous with the fastigium of frons, much narrower than the first antennal segment. Eyes small, round, moderately prominent, *c.*1.5 times as long as the subocular groove and as wide as the retroocular space (Figure 6C).

Pronotum longer than high, its humeral excision not very deep and not indented anteriorly; lateral lobes rather with straight hind margin and curved ventral margin (Figure 6A).

Fore coxae armed with one small spine, fore femora with 3 spines on inner ventral margin [8–9 according to Ragge (1980)], fore tibiae with open tympana on both sides, superiorly rounded, not furrowed (Figure 6G) with 3 inner ventral spines + 1 spur on each side, mid femora with 3 outer spines, mid tibiae with 8 outer ventral spines + 1 spur on each side, hind femora with 6 outer and 4 inner ventral spines, hind tibiae with 15 inner and outer ventral spines, and many inner and outer dorsal spines + 1 spur on each side.

Tegmina well developed, slightly shiny and a bit shorter than hind wings. In the area of overlapping tegmina, a series of microscopic bristles cover the transverse veinlets of the right tegmen [according to Heller et al. (2015), females of *Phaneropterinae* have some teeth on the right tegmen to communicate with the other sex].

Ovipositor gently up-curved, 2.4 times longer than pronotum, cerci conical and slender.

Measurements. The female above reported is smaller than that recorded by Ragge (1980), whose measurements are reported in parenthesis. Body length: 20.9 (38.3); pronotum length: 3.8 (4.3); pronotum height: 3.4; length of tegmina: 26.6 (26.5); width of tegmina: 5.7; length of hind wings: 32.7; length of hind femora: 18.0 (18.7); ovipositor: 9.2 (8.1).

Distribution. Known only from Annobon Is. (17.5 km²), which is *c.*350 km off the West African coast and 180 km off the island of Sao Tomé.

Tribe Holochlorini Brunner von Wattenwyl, 1878

Dapanera falxcercata n. sp. (Figure 7A–7E)

Type material. Holotype: ♂, Cameroon, Mundame [04°34'26"N 09°30'25"E], R. Rohde (coll. Brunner von Wattenwyl, NMW). Paratype: 1 ♀, same data (coll. Brunner von Wattenwyl, NMW).

Description. Male (Figure 7A, 7C, 7D, 7E). Medium sized. Green-yellowish, tympana bordered by black margins.

Head. Fastigium of vertex narrow, furrowed above. Eyes rounded, well projecting.

Legs comparatively long. Fore coxae armed with a well-developed spine. Fore tibiae furrowed on upper margin, distinctly widening above tympanum, which is closed on inner and open on outer side. Fore femora unarmed, fore right tibia with 2 spines (fore left with 3) plus 1 spur on inner margin, outer ventral margin unarmed, 1 spur on outer dorsal margin, mid femora armed with 2 spines on outer ventral margin, mid tibiae with 8 on outer and inner ventral margins, plus 1 spur on each side, hind femora armed with 7 spines on inner and 6 on outer ventral margins, hind tibiae with many spines on ventral and dorsal margins and 3 spurs on each side.

Thorax. Pronotum little narrowing anteriorly, flat above, anterior margin straight, posterior margin widely rounded, humeral sinus evident, lobes of pronotum rounded.

Tegmina comparatively wide with rounded apices. Wings longer than tegmina. Stridulatory region of left tegmen narrow.

Abdomen. 10th tergite with straight hind margin; cerci long, stout, incurved at obtuse angle, thus narrowing,

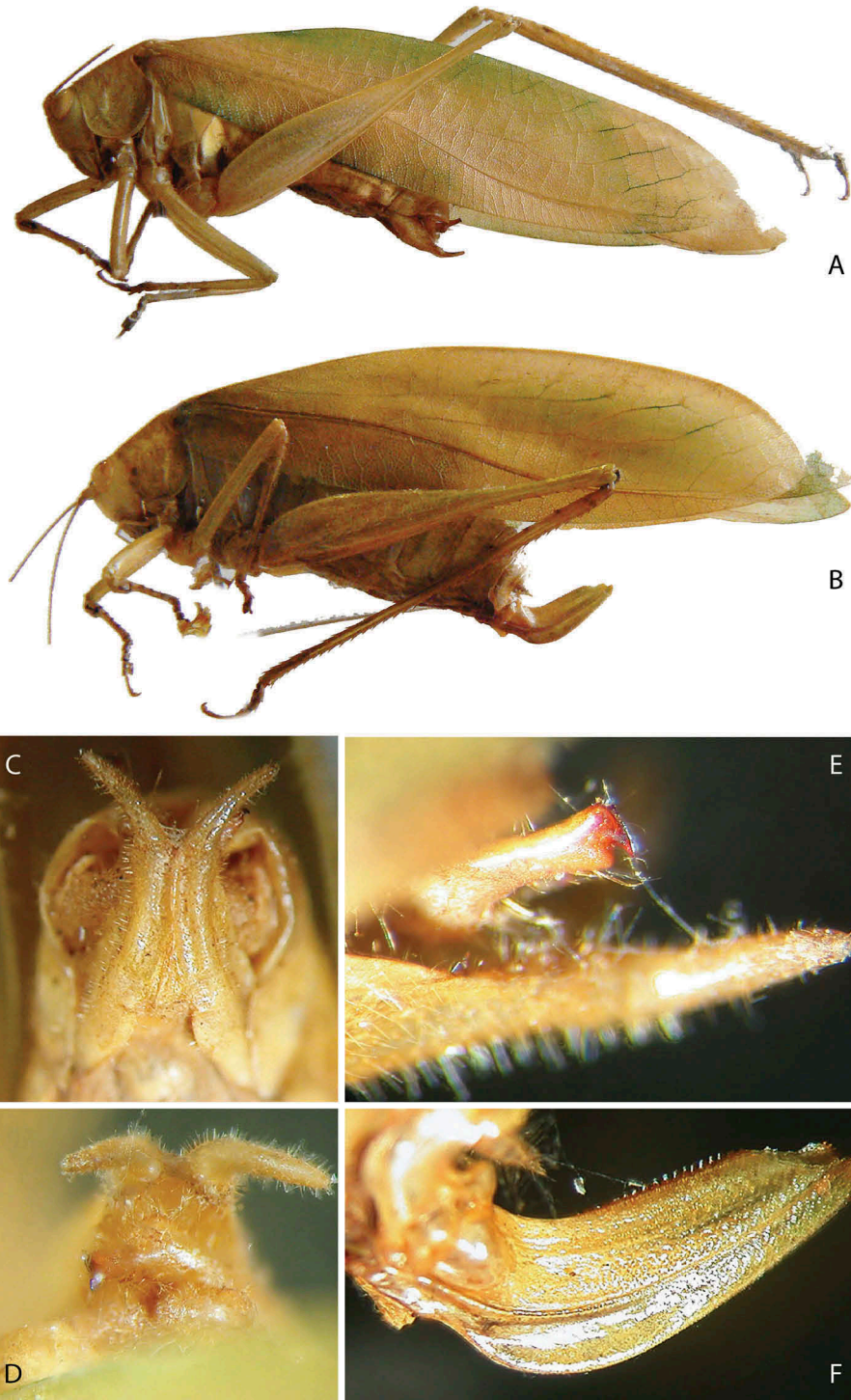


Figure 7. *Dapanera falxcercata* n. sp. **A, B,** Habitus: **A,** ♂; **B,** ♀. **C,** ♂, subgenital plate. **D,** ♂, dorsal view of last abdominal segments. **E,** ♂, cerci. **F,** ♀ ovipositor, lateral view.

flattened and with a chitinous black apex ending as a sharp nail, shorter than subgenital plate (Figure 7D, 7E). Subgenital plate long and not divided, with a central keel; styli stout, long and diverging (Figure 7C, 7D).

Female (Figure 7B, 7F). Same characters as the male, with the following differences. Fore femora armed on inner ventral margin with 4 spines, fore tibiae with 4 spines plus 1 spur on inner and outer ventral margins, 1

spur on outer dorsal margin, mid femora armed with 5 spines on outer ventral margin, mid tibiae with 6 on outer and inner ventral margins, plus 1 spur on each side, hind femora armed with 7–8 spines on outer and inner ventral margins, hind tibiae with many spines on ventral and dorsal margins and 3 spurs on each side. Ovipositor gently

up-curved, cerci pointed, subgenital plate triangularly pointed (Figure 7F).

Measurements. Male. Body length: 24.3; pronotum length: 6.3; pronotum height: 5.1; hind femur: 20.8; tegmina: 38.6. Female. Body length: 25.1; pronotum

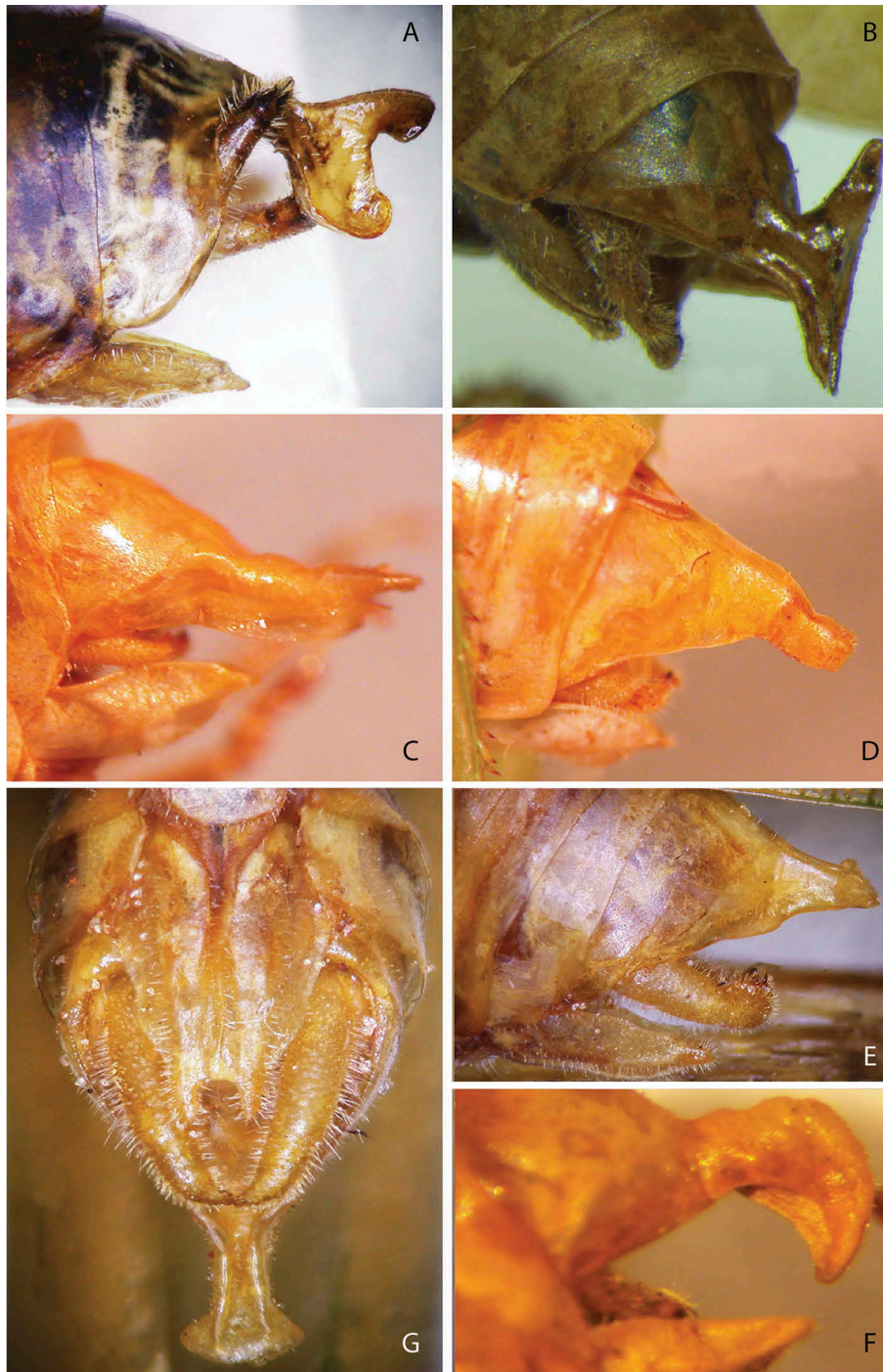


Figure 8. A–F, Lateral view of last abdominal segments of male: A, *Eurycorypha klaptoczi* Karny; B, *E. aequatorialis* Krauss; C, *E. velicauda* Karsch; D, *E. securifera* Brunner von Wattenwyl; E, *E. flavescens* (Walker); F, *E. combretoides* Hemp. G, *E. flavescens*, subgenital plate and cerci.

length: 6.0; pronotum height: 5.0; hind femur: 20.2; tegmina: 34.7; ovipositor: 6.7.

Diagnosis. A typical *Dapanera*, the male is easily distinguished from all other *Dapanera* by its sickle-shaped cerci and long and diverging styli on the subgenital plate.

Etymology. From Latin (with *cercus* similar to a *falx* = sickle), feminine adjective.

Tribe Amblycoryphini Brunner von Wattenwyl, 1878

Eurycorypha prasinata Stål, 1874

Material examined. Madagascar, Antalaha [14°54'S 50°16'E] (1 ♀) (NMHP).

Distribution. Known from Madagascar and Comore Is. (Chopard 1958) and reported from various African countries by Karsch (1888), and South Africa by De Saussure (1899).

Eurycorypha flavescens (Walker, 1869) (Figure 8E, 8G)

Material examined. Ivory Coast, Comoe, Kolomabira (228 m) 11.XI.2014 (UV), P. Moretto (1 ♂) (BMPC); Ivory Coast, Boundiali, M' Banto 6–8.VII.2013 (UV), P. Moretto (1 ♀) (BMPC); Ivory Coast, Man, Mt. Tonkoui (1200 m) 18.VIII.2015 (UV), P. Moretto (1 ♂) (BMPC); Ivory Coast Korhogo, Kogo (dry forest) 21.VII.2014 (UV), P. Moretto (1 ♂, 5 ♀) (BMPC); Ivory Coast Korhogo, Kogo village 20.VII.2014 (UV), P. Moretto (1 ♀) (BMPC); Central African Republic, Ndoki, border of Lake 1 20–23.II.2012 (UV), P. Moretto (1 ♀) (BMPC).

Remarks. *Eurycorypha flavescens* was described by Walker (1869) on a female from Gambia, characterized mainly by the very long ovipositor (as long as the abdomen). Kirby (1906) transferred it to the genus *Corycomina* Karsch, 1896 and synonymized *Corycomina camerata* (Karsch, 1888) with *Corycomina flavescens* (Walker, 1869). Griffini (1908) and Sjöstedt (1912) recorded *Corycomina flavescens* from Cameroon, but later Ragge (1980) established that *Corycomina camerata* and *Eurycorypha flavescens* are two distinct taxa belonging to different genera. This species is very peculiar for its very long ovipositor; thus, studying a series of specimens it was possible to match males and females, discovering after nearly 150 years the male of *E. flavescens*. *E. adicra* from Cameroon is the only other species with such a long ovipositor. However, the shape of the ovipositor is different, being strongly up-curved with obtuse tips of the valves (Karsch 1892).

Description of male. Species of medium size. Green, legs yellowish.

Head typical of the genus, eyes oval, fastigium of vertex wide, ca. three times as wide as scapus. Frontogenal carinae not much developed. Antennae long, scapus green, remaining part yellow.

Pronotum flat, concave on the anterior margin and with rounded posterior margin. Lateral carinae distinct, humeral excision well-developed, integuments smooth.

Both pairs of wings well-developed. Tegmina oval, rounded at tips, about 2.7–2.8 times longer than wide. Hind wings longer than tegmina.

Fore coxae armed, fore tibiae with open tympana, fore femora with 3 inner ventral spines, fore tibiae with 4–5 spines on inner and on outer ventral margins; mid femora with 1–2 outer ventral spines, mid tibiae with 4 inner and outer ventral spines; hind femora with 4–5 inner and outer ventral spines.

Last abdominal tergite modified, ending with a protruding appendix, whose surface is superiorly sulcate, with enlarged spoon-shaped apex, cerci stout and incurved, with two apical chitinous teeth (Figure 8E). Styli absent, subgenital plate long, narrow, with an apical concavity and two appendices similar to styli (Figure 8G).

Affinities. Males of *Eurycorypha securifera* Brunner von Wattenwyl, 1878 are most similar to those of *E. flavescens*. Differences are the following: last tergite laterally compressed with a cut and axe-shaped apex, cerci short with cut apex, subgenital plate wide, apically rounded with very small styli (Brunner Von Wattenwyl 1878). Other related species are illustrated in Figure 8A–8D, 8F, 9A–9G.

Distribution. Previously known only from Gambia, *Eurycorypha flavescens* is here reported for the first time from Ivory Coast and Central African Republic; thus, its distribution covers central-western Africa.

Eurycorypha klaptoczi Karny, 1917 (Figure 8A)

Material examined. Burkina Faso, Pama [11°14'N 0°43'E] VIII.2005, P. Moretto (4 ♂) (BMPC); Ivory Coast, Tiené (671 m) 8.VII.2013 (UV), P. Moretto (1 ♂) (BMPC); Ivory Coast, Boundiali, M' Banto 6–8.VII.2013 (UV), P. Moretto (2 ♂, 1 ♀) (BMPC); Ivory Coast, Bondoukou Zamou VII.2004, P. Moretto (1 ♂) (BMPC); same data 6–7.VI.2015 (UV), P. Moretto (2 ♀) (BMPC); same data 10.IV.2016 (1 ♀) (BMPC); Ivory Coast, Comoe, Kolomabira (228 m) VII.2015 (UV), P. Moretto (1 ♂, 4 ♀) (BMPC); Ivory Coast, Korhogo, Kogo (dry forest) 23.VII.2014 (UV), P. Moretto (1 ♂) (BMPC); Ivory Coast, Man, Mt. Tonkoui (1200 m) 18–20.VI.2015 (UV), P. Moretto (3 ♀) (BMPC); same data 17.X.2015 (1 ♀) (BMPC); Togo, Fazaou (hotel) [8°41'N 0°46'E] 3–4.VIII.2013 (UV), P. Moretto (1 ♂) (BMPC).

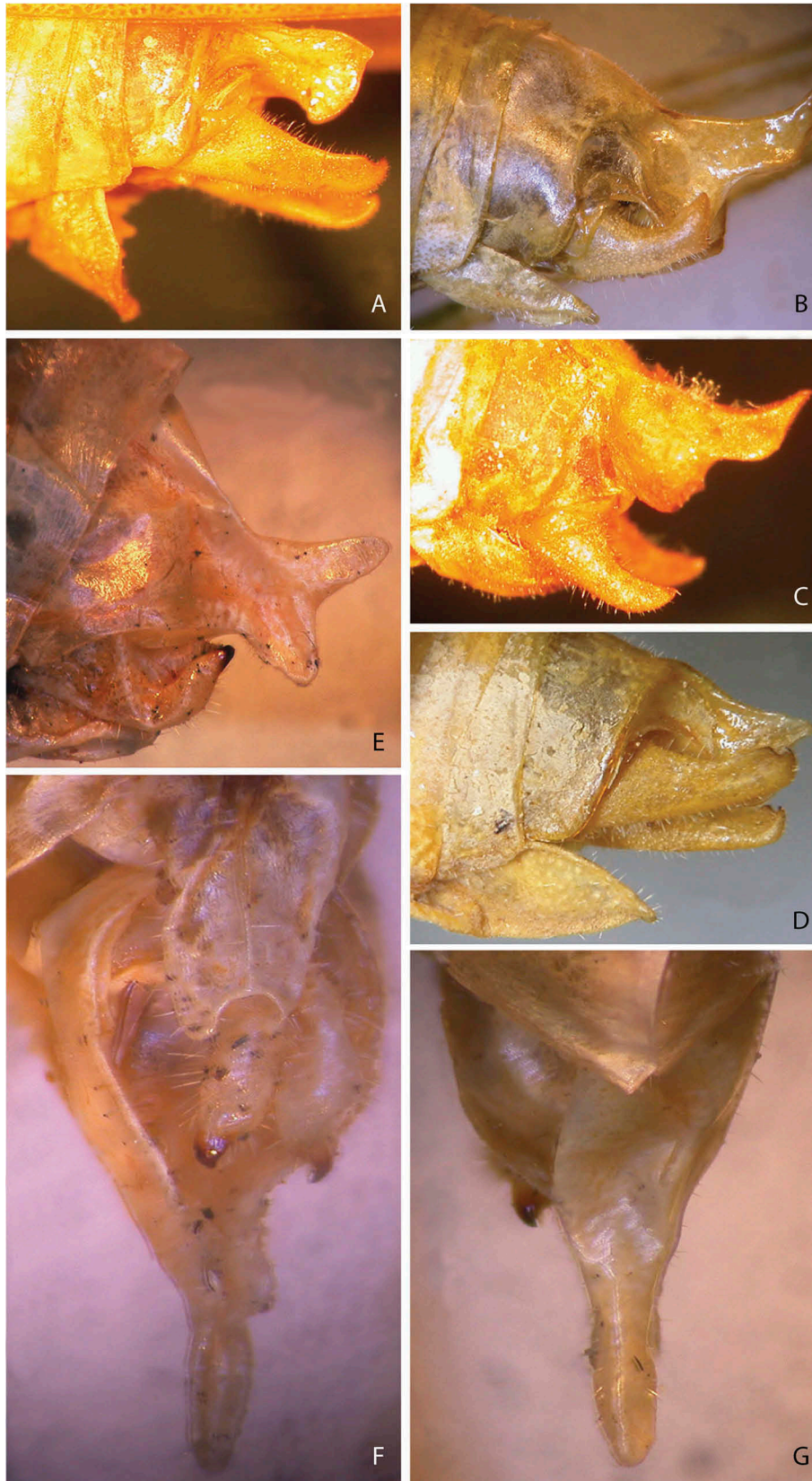


Figure 9. Lateral view of last abdominal segments of male. **A**, *Eurycorypha laticercis* Chopard. **B**, *E. stylata* Stål. **C**, *E. stenophthalma* Chopard. **D**, *E. darlingi* Uvarov. **E**, *E. specularia* n. sp. **F**, *E. specularia* n. sp.: **F**, dorsal view of last abdominal segments; **G**, subgenital plate and cerci.

Remarks. *Eurycorypha klaptoczi* was described by Karny (1917) on a female from Guinea (West Africa), characterized by a short and strongly up-curved ovipositor, more or less as long as the pronotum and shorter than the fore tibiae, subgenital plate triangular. It is a large sized species. The following species of *Eurycorypha* were described on the female sex only; all of them are different from the female of *E. klaptoczi*. *E. adicra* Karsch, 1892 from Cameroon has a robust ovipositor, *E. brevicollis* Stål, 1876 from Namibia has a short pronotum and ovipositor; *E. brevipennis* Karsch, 1889 from Madagascar has a wrinkled pronotum with definite margins, wings rather short and very oval; differences from *E. flavescens* are above described; *E. montana* Sjösted, 1902 from Cameroon has a rather long ovipositor and the apex of subgenital plate is concave; *E. mutica* Karsch, 1891 from Cameroon has rather long and crenulated ovipositor, the subgenital plate triangular, apically straight, and longitudinally concave on the centre; *E. zebra* Bruner, 1920 is a species of large size (30 mm), and has tegmina rather oval with vertical sinuous evident veinlets.

Description of male. Species of medium size. Green, legs yellowish.

Head typical of the genus, eyes oval, fastigium of vertex wide, ca. three times as wide as scapus. Fronto-genal carinae poorly developed. Antennae long, green.

Pronotum flat, concave on the fore margin and rounded on the hind margin. Lateral carinae distinct, humeral excision anteriorly well-developed, its integuments wrinkled.

Both pairs of wings well-developed. Tegmina oval, rounded at tips, about 3.3–3.7 times longer than wide. Posterior wings longer than tegmina.

Fore coxae armed with one spine, fore tibiae with open tympana, fore femora with 3 inner ventral spines, fore tibiae with 4–5 spines on inner and on outer ventral margins; mid femora with 2–3 outer ventral spines, mid tibiae with 6–7 inner and outer ventral spines; hind femora with 6–7 inner and outer ventral spines.

Last abdominal tergite modified, ending with a protrusion, whose surface is superiorly sulcate, with two appendices, one up-curved with two divergent flat apices, above a little rounded, below concave, the other down-curved, laterally compressed and sulcate on the upper surface, with two flat lateral apices. Cerci stout and incurved, apically toothed (Figure 8A). Styli absent, subgenital plate long and narrow.

Measurements. Male. Body length: 19.4–26.6; pronotum length: 4.0–5.0; length of tegmina: 29.9–33.6; width of tegmina: 8.0–10.2; length of hind femora: 15.0–17.0. Female [in brackets values after Karny (1917)]. Body length: 18.4–22.4 (20.0); pronotum length: 4.0–4.8 (4.8); length of tegmina: 28.3–31.6 (29.5); width of tegmina:

8.3–9.9 (9.0); length of hind femora: 14.6–17.0 (14.5); ovipositor: 4.6–5.4 (4.6).

Affinities. Characteristics of the last tergite of male are very peculiar, morphologically related to *Eurycorypha stylata* Stål, 1873 (Figure 9B) and *E. specularia* n. sp. (Figure 9A, 9F, 9G).

Distribution. Hitherto known from Guinea, it is here recorded for the first time from Ivory Coast, Burkina Faso and Togo. In some localities of Ivory Coast (Kolomabira, M' Banto, Kogo), *Eurycorypha klaptoczi* has been found together with *E. flavescens*.

Eurycorypha specularia n. sp. (Figure 9E, 9F, 9G)

Type material. Holotype: ♂, Zambia NW, Mulobezi [16°47'59"S 25°10'26"E] 8–27.VIII.1988, P. Agnelli (MZUF). Paratype: 1 ♀, same data (MZUF).

Description. Male. Species of small size, yellowish.

Head typical of the genus, eyes oval, fastigium of vertex wide, *c.*3 times as wide as scapus. Fronto-genal carinae well developed. Antennae long, yellow.

Pronotum flat, anterior margin concave, posterior margin rounded. Lateral carinae distinct, humeral excision well-developed; integuments smooth.

Both pairs of wings well developed. Tegmina oval, rounded at tips, about 3.6 times longer than wide. Many transparent small cells on tegmina. Hind wings longer than tegmina. Stridulatory file *c.*1.0 mm long, a little curved, consisting of *c.*65 teeth, of which the central are bigger than the proximal and distal ones.

Fore coxae armed, fore tibiae with open tympana, fore femora with 3 inner ventral spines, fore tibiae with 5 spines on inner and on outer ventral margins; mid femora with 3 outer ventral spines, mid tibiae with 8 inner and outer ventral spines; hind femora with 8 inner and outer ventral black tipped spines.

Last abdominal tergite modified, ending with a protruding up-curved and laterally compressed appendix, and a down-curved, laterally compressed and inferiorly furrowed appendix, with two flat lateral apices. Cerci stout and up-curved, apically toothed (Figure 9E, 9G). Styli absent, subgenital plate long and narrow (Figure 9F).

Female. Same characters as the male, but tegmina 3 times longer than wide, hind femora with 9 spines, cerci conical, subgenital plate triangular and centrally furrowed, ovipositor gently up-curved.

Measurements. Male. Body length: 15.0; pronotum length: 4.0; length of tegmina: 25.0; width of tegmina: 6.9; length of hind femora: 12.1. Female. Body length: 15.5; pronotum length: 4.1; length of tegmina: 28.2; width of tegmina: 9.4; length of hind femora: 13.7; ovipositor: 4.8.

Etymology. After its characteristic small transparent cells (from Latin *speculum*) of tegmina.

Diagnosis. Small species, characterized by many small transparent cells on tegmina; the male has the last tergite modified, similar to that of medium-sized *Eurycorypha stylata* and *E. klaptoczi*.

Distribution. Actually known only from the type locality, on the North-West Zambia (southern Africa).

Tribe Poreuomenini Brunner von Wattenwyl, 1878

Poreuomena lamottei Chopard, 1954 (Figure 10A–10E)

Material examined. Ivory Coast, Azagny National Park [5°14'N 4°52'W] 26.XI–1.XII.2015 (light trap), M. Aristophanous, P. Moretto, E. Ruzzier (3 ♂) (NHM); Ivory Coast, Taï National Park, Res. Station [05°49'59"N 07°20'32"W] 5–10.VII.2015 (light trap), M. Aristophanous, P. Moretto, E. Ruzzier (1 ♂) (NHM).

Remarks. Characters of *Poreuomena lamottei* consent to identify it easily (Figure 11A–11E); the stridulatory file is arched and consists of *c.*60 teeth, of which *c.*30 big teeth in the distal part and *c.*30 smaller and evenly spaced teeth in proximal part (Figure 10B)

Distribution. Known from Guinea and Ghana (Chopard 1954b; Naskrecki 2009), it is newly reported from Ivory Coast.

Tribe Tylopsidini Brunner von Wattenwyl, 1878

Tylopsis fissa Ragge, 1964

Material examined. Malawi, Mubanga Forest [9°47'44"S 33°19'17"E] 1910, Bayon (11 ♂, 1 ♀) (MSNG); Kenya, Masai Mara National Park [1°25'33"S 34°53'13"E] (1600 m) 11.VI.1994, L. Bartolozzi (1 ♂) (MZUF).

Distribution. Previously known only from the type locality (Entebbe, Uganda) (Ragge 1964), the presence in Kenya and Malawi extends its distribution remarkably southwards.

Tribe Catoptropterigini Massa, 2016

Catoptropteryx extensipes Karsch, 1896

Material examined. Nigeria, surroundings of Sapele [05°52'30"N 05°41'36"E] VIII.1925, E. Zavattari (1 ♂) (MSNG).

Distribution. *Catoptropteryx extensipes* was previously known from Cameroon, Central African Republic, Sierra Leone, Liberia, Equatorial Guinea (Fernando Poo), Ivory



Figure 10. *Poreuomena lamottei* Chopard, ♂. **A**, Dorsal view of tegmina and stridulatory area. **B**, Stridulatory file. **C**, **D**, last abdominal segments and cerci: **C**, lateral view; **D**, dorsal view. **E**, Subgenital plate.

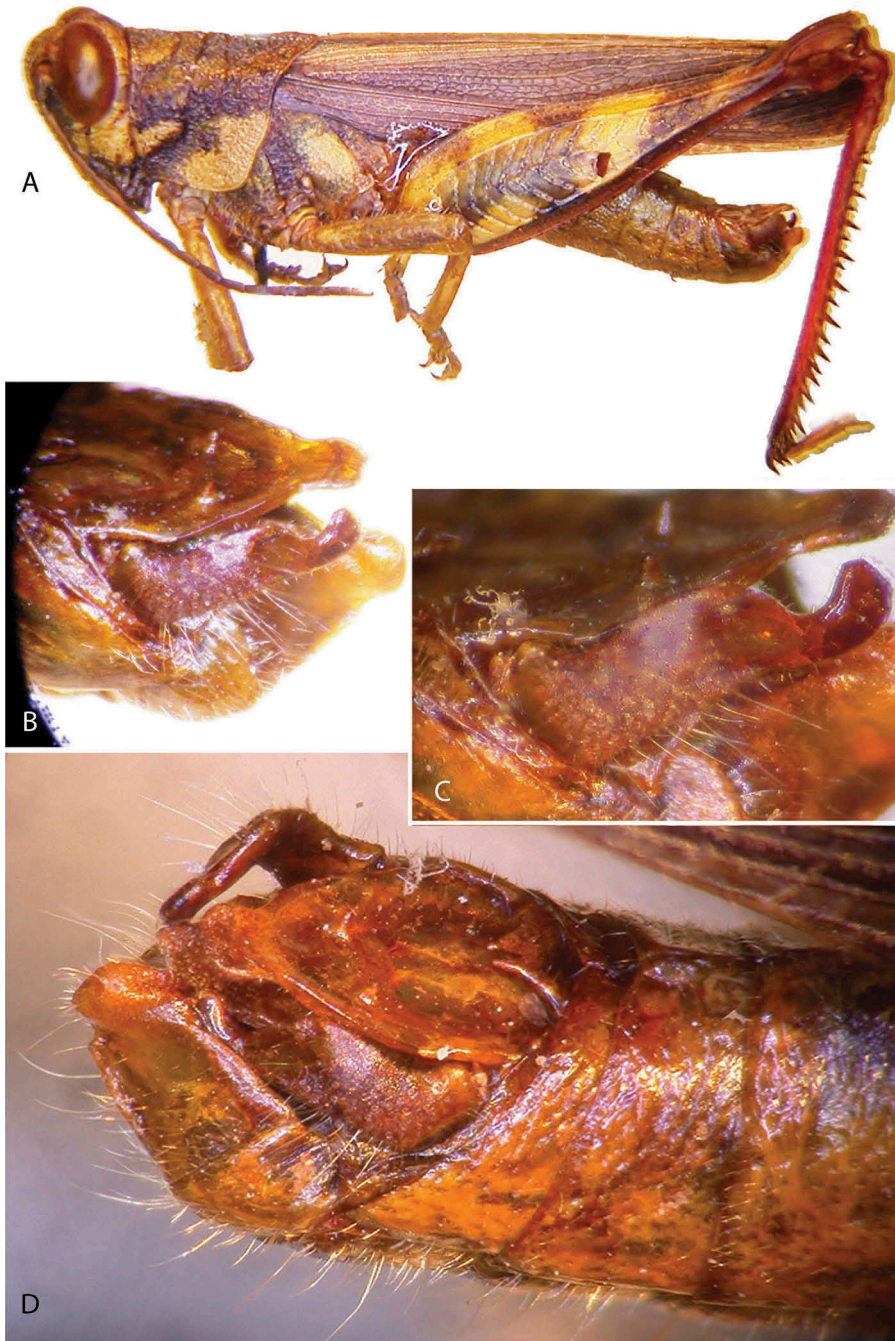


Figure 11. *Eucoptacra popovi* n. sp., ♂ holotype. **A**, Habitus. **B**, lateral view of last abdominal segments. **C**, Details of left cercus. **D**, dorsolateral view of last abdominal segments.

Coast and Ghana (Karsch 1896; Huxley 1970, 1972; Naskrecki 2009; Massa 2013); it is newly recorded from Nigeria.

Material examined. Ivory Coast, Taï National Park, Res. Station [05°49'59"N 07°20'32"W] 5–10.VII.2015 (light trap), M. Aristophanous, P. Moretto, E. Ruzzier (2 ♂, 1 ♀) (NHM).

Phaneropterinae of uncertain tribe
Mangomaloba latipennis Chopard, 1954

Distribution. Known from Guinea and Ghana (Chopard 1954b; Naskrecki 2009), it is newly reported from Ivory Coast.

Family Acrididae MacLeay, 1821

Subfamily Coptacrinae Brunner von Wattenwyl, 1893

Eucoptacra popovi n. sp. (Figure 11A–11D)

Type material. Holotype: ♂, Gabon, Njolé [0°07'10"S 11°59'55"E] XI-XII.1902, L. Fea (MSNG) (a label written by G. B. Popov in 1992 reports “*Eucoptacra* new species?”).

Description of male. Figure 11A–11D. Light brown the first and the last two antennal segments, dark brown the others, pronotum light brown anteriorly, dark brown posteriorly, lateral lobes yellow with a central brown spot. Hind margins of tegmina lighter than the rest of the surface. Posterior femora dark brown with four wide yellow bands, the central band not reaching the lower keel. Inner surface and base of femora reddish, tibiae red with apex brown with 9 outer and 10 inner black tipped spines, rather hirsute.

Antennae much longer than head and pronotum together.

Pronotum with low median carina cut by three sulci, its posterior margin with right angle.

Tegmina with apices of the same length as folded hind femora.

Cerci deep basally with a short appendix as high as the base of cerci, similar to a sickle (Figure 11B, 11C). Supra-anal plate with two central small spines, converging apically to a flat lobe (Figure 11D). Subgenital plate narrow apically. It was not possible to extract genitalia because of the poor state of the specimen.

Female unknown.

Diagnosis. *Eucoptacra popovi* n. sp. is easily distinguished from other species of the genus by its large size, red hind tibiae, very long antennae and sickle-shaped cerci.

Measurements. Male. Body length: 20.4; length of pronotum: 4.7; height of pronotum 4.2; length of tegmina: 15.6; length of hind femora: 12.7.

Etymology. This species is named after George Basil Popov (1922–1998), Russian-British entomologist, authority on desert locusts, who received the Lawrence of Arabia Memorial Medal (1995) from the Royal Society for Asian Affairs. In 1992, he identified as a probable new species the specimen here described.

Remarks. The genus *Eucoptacra* Bolívar, 1902 includes 29 species covering tropical Africa and Asia, of which 17 live in Africa. Dirsh (1966) presented a key to 14 of these species; later, another three species were described (*E. spathulacauda* Jago, 1966 from Ghana, *E. granulata* Mason, 1977 from Angola, and *E. bicornis* Baccetti, 2004 from Ivory Coast). Following Dirsh (1966, 1970) and Baccetti (2004), males are easily identified by the shape of cerci and colour of hind

tibia. *E. popovi* n. sp. has red tibia and male cercus with apical appendix clearly different from those of all described species, included the three described after the publication of Dirsh (1966). In particular, *E. spathulacauda* and *E. bicornis* lie within the group of *E. anguliflava* (Karsch, 1893), widespread from West to East Africa, *E. exigua* Bolívar, 1912 from East Africa and *E. basidens* Chapman, 1960 from Ghana and Ivory Coast; instead, *E. granulata* lies within the group of *E. similis* Uvarov, 1953 from Angola, *E. poecila* Uvarov, 1939 from Angola, Democratic Republic of Congo and Rhodesia, and *E. nana* Uvarov, 1953 from Angola (Jago 1966; Dirsh 1966; Mason 1977; Baccetti 2004; Felix & Massa 2016). There are two species with red tibiae, as in *E. popovi* n. sp.: *E. gowdeyi* Uvarov, 1923 from Uganda, Kenya and Tanzania, and *E. turneri* Miller, 1932 from South Africa, but the appendix of their cerci is very fine, like that of *E. torquata* Bolívar, 1912, *E. exigua* and *E. spathulacauda*, that however do not have a red hind tibia. Cerci of *E. popovi* n. sp. are very peculiar, because the appendix is as high as the base of cercus and is separated from it by a wide concavity; overall, the cercus is similar to a sickle. Finally, antennae are very long compared to other known species (however, *E. basidens* and *E. bicornis* have antennae as long as *E. popovi* n. sp.), and the size is large for the genus.

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